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Determinants of American Stock Prices on a Firm-Specific Level

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Abstract
As of January 2011, there were $ 14 trillion invested in the New York Stock Exchange (NYSE) and $55.6 trillion invested in all stock exchanges around the world (World Federation of Exchanges, 2011). To put that number into perspective, the US gross government debt at the same time was $13.5 trillion (US Government Debt, 2011). The US annual GDP, which is the highest in the world, was $14.58 trillion (WorldBank, 2011). Stocks are equities that allow investors to put their money into a company with the hopes of achieving a higher return than that of a savings account or bond. Stock prices fluctuate often and are considered indicators of how well a company is doing. Due to uncertainty there is risk, but if one is skilled at picking stocks then there is the potential for great reward as well. This fact makes knowing the determinants of stock prices very valuable and extensively studied.

DETERMINANTS OF AMERICAN STOCK PRICES ON A FIRM-SPECIFIC LEVEL

Cory Sloan

I. INTRODUCTION

As of January 2011, there were $ 14 trillion invested in the New York Stock Exchange (NYSE) and $55.6 trillion invested in all stock exchanges around the world (World Federation of Exchanges, 2011). To put that number into perspective, the US gross government debt at the same time was $13.5 trillion (US Government Debt, 2011). The US annual GDP, which is the highest in the world, was $14.58 trillion (WorldBank, 2011). Stocks are equities that allow investors to put their money into a company with the hopes of achieving a higher return than that of a savings account or bond. Stock prices fluctuate often and are considered indicators of how well a company is doing. Due to uncertainty there is risk, but if one is skilled at picking stocks then there is the potential for great reward as well. This fact makes knowing the determinants of stock prices very valuable and extensively studied.

This paper uses the idea of semi-strong form market efficiency in order to determine which variables to look at. Essentially the semi-strong hypothesis is that the stock prices are determined by all the publicly available information. Much of the past literature takes this to mean that any changes in a company's financials would soon be reflected in the stock price. This study will go a step further and try to incorporate information beyond the financials such as the point in the business cycle, the volume of a stock being traded, and variables for recent news about a company. This analysis will be done on eight companies from the Dow, each from a different industry.

Section II looks at past literature on stock price predictability and develops the theory behind this study. Section III presents the empirical model. Section IV shows the results of the study. Section V concludes.

II. THEORY AND LITERATURE REVIEW

There have been a number of studies done on stock price predictability and the theory has evolved greatly, but first the existence of stock price predictability must be established. "It is often argued that if stock markets are efficient then it should not be possible to predict stock returns, namely that none of the variables in the stock market regression (1) should be statistically significant" (Pesaran, 2003). Skeptics of stock price predictability argue that markets are efficient and any opportunity to make money will disappear as soon as it arises due to markets acting efficiently. So, any change in a company will be immediately reflected in the stock price. In theory this is sound but a number of studies have found fundamental variables to be significant when predicting stock movements. "Recently, a large number of studies in the finance literature have confirmed that stock returns can be predicted to some degree by means of interest rates, dividend yields and a variety of macroeconomic variables exhibiting clear business cycle variations." (Pesaran, 2003) This can be attributed to stock investor error. Stocks are traded based on human action. One must actually go through the action to sell or buy the stock. Sometimes an investor will not always hear of changing information right away and thus it takes time for investors to sell their existing shares or buy new ones. This creates a lag from the time new information is introduced in the market and when it is actually reflected in the stock price. This leads one to assume that it would be possible to predict the movements of stock prices by using the current market information.

This brings us to the theory on market efficiency. There are three believed forms of market efficiency: weak-form, semi-strong from, and strong form. Weak-form was the initial theory and was believed to be true in the 1970's. Proponents of the weak-form hypothesis believe that stock prices follow a random walk and the only significant predictor of stock prices would be the past value of the prices themselves. This has some merit as it can be a good indicator of how variable a stock tends to be. "Estimating ARMA models, Conrad and Kaul find that the auto-regressive

coefficients for weekly returns on stock portfolios are positive, near 0.5, and can explain up to 25 per cent of the variation in the returns on a portfolio of small-firm stocks." (Ferson, 2008) For example, Microsoft has been quite stagnant at $25 per share for years, so the past value can predict the future value very easily. The same is true for Apple as it has generally followed an upward trend for the past decade and the past values can show that. The weak-form hypothesis can also account for seasonal effects by accounting for when a certain company's stock tends to be higher or lower. However, it is too basic to create any truly accurate predictions, so the semi-strong form hypothesis arose. This paper focuses on the semi-strong form theory. It assumes that stock prices are determined by a vector of all publicly available information.

This is most commonly assumed to be the company's financials such as sales, net income, book value, dividends, etc. Many studies have looked at numbers such as these and found many to be significant, giving further proof of the existence of both stock price predictability and semi-strong form efficiency. Ferson (2008) looked at a number of past studies on stock return regressions and found variables such as cash flows over price, dividend-price ratios and book value to be significant.

The last form of market efficiency is strong form, which assumes that stock prices are a vector of all information, including insider information. This would include everything from insider trading to predictions of future performance of the company. This would be ideal to study but impossible due to the fact that investors do not have access to insider information and must thus make decisions based on publicly available information.

When looking at the semi-strong form market efficiency, current literature only looks at company financials. However, the theory is that all publicly available information affects a stock's price. This study will attempt to fill some gaps in other literature by adding variables that are not found on a balance sheet or income statement. The proposed variables will account for recent events such as acquisitions, divestitures and management changes. There will also be a control variable for the state of the economy. A dummy variable for whether or not the economy is in a state of recession will be included as well due to its correlation with stock prices (Ferson, 2008). The magnitude of the effect of a changing economy is not known, however, so we will also include changes in the Dow Jones Industrial Average (DJIA) to show the relative strength of the stock market as a whole.

The majority of past literature looks at predicting various stock market indices such as the S&P 500 or the Dow Jones Industrial Average and has come into some success with that. Taubee (2001) successfully predicted about 67% of the variation in the S&P 500. This is due to the fact that by averaging a number of stock movements it is easier to see the effect of a variable on a number of stocks. The problem with these studies is their limited use and application. Knowing where the stock market as a whole is likely to go provides knowledge on when to invest but not where to invest. Even in times of expansion there are still stocks that drop in value and stocks that do not increase significantly. A firm-specific model could compare each firm and allow you to invest in the highest expected earners.

This study uses a firm-specific model and will use a diverse set of firms from all sectors of the economy. The finance sector was left out due to the fact that it reports different variables on its quarterly reports than any other sector. The companies were chosen from the 30 companies which make up the DJIA. Much analysis has been done on which companies best represent the stock market as a whole and this paper will use the companies already deemed to be the best representations of the stock market. There were eight companies (tickers) chosen: Caterpillar (CAT), Procter & Gamble (PG), McDonald's (MCD), Walmart (WMT), Intel (INTC), Johnson & Johnson (JNJ), Exxon Mobil (XOM) and AT&T (T). The rationale for choosing these companies from the Dow is that they are all from different sectors. Different sectors tend to perform differently during different economic times. For example, in times of recession, consumers tend to demand fewer normal goods so the sale of luxury goods decreases drastically. However, necessities such as health care are somewhat independent of the business cycle and consumers will spend on these goods regardless of the economic conditions. In order to control for these effects, we picked companies from all sectors to diversify as much as possible.

$$\text{Stock Price} = \beta_0 + \beta_1(\text{Vector for all Publicly Available Information}) + u$$

The above equation is the theoretical model for the study and would be the most accurate representation of the semi-strong hypothesis. This theoretical model is obviously impossible to predict perfectly as there are too many variables to put into one study. Many of the variables may not have a quantitative value to use in this equation. So, the challenge is to create a model that best represents this theory
in the hopes that an accurate prediction will be achieved. This study uses data from the past quarter in order to predict the current value of stocks. We can then use that equation to forecast future values even though we will not be able to check their accuracy until the next quarter. The reason for using quarterly data is twofold: 1) Dividends have been found to be significant in past studies (Pesaran, 2003) and since they are only given once per quarter this was the shortest possible time-frame and 2) Accounting for high-frequency trading and daily fluctuations causes more problems than it solves. High-frequency trading is a new form of stock trading that involves buying stocks in large quantities and quickly selling them when the price goes up by a small margin. A study done by Kyle Portnoy has proven this to be insignificant on any horizon longer than one week so it will be left out of this study (2011). It has also been established that longer term trends, such as one quarter, have more predictive accuracy and applicable use. "The R-squares are larger for longer-horizon returns" (Ferson, 2008).

III. EMPIRICAL MODEL

The regressions for our prediction model will be organized as panel data. The software used is SPSS. It is used to run linear regressions as well as test for any diseases such as autocorrelation or heteroscedasticity.

The financial variables in this study were collected from EDGAR's (2011) Filings and Forms. EDGAR's Filings and Forms is a government website that saves all of a company's quarterly reports and the data is audited to ensure accuracy. The stock prices, dividends, DJIA and volume variables were downloaded from Yahoo! Finance. The recession variable comes from the National Bureau of Economic Research (NBER), the organization that declares the start and end of a recession. The recent news variables were collected from a company timeline on AlacraStore.com. All the variables and their expected signs can be seen in Table 1.

For each variable on the table, with the exception of dummy variables, there was another variable created that reflected the change in the past quarter. It was calculated the same way that the percent return variable was calculated.

The rationale behind this was that if stock prices already reflect all available information, then the new information should have the most significant effect on the future price.

The initial dependent variable is the current stock price instead of predicted returns. Many studies in the past try to predict returns and it has been found that you can get more accurate predictions if you attempt to predict the price of the stock rather than its percentage of expected return (Kaboudon, 2000). Next, I run a regression attempting to predict the returns to see if there are any similarities in the significant independent variables and as a way to standardize the stock price across the eight different companies. This will allow for more results as well because it will give an insight into which method is more accurate and also which method gives more applicable results. With respect to the independent variables, there are dozens of financial ratios available; however, they tend to stem from the same numbers. One can assume then that if you include the common numbers you will account for many of these ratios as well. This will also attempt to minimize issues of autocorrelation by selecting fewer financial ratios which often share variables. These ratios tend to be correlated with one another, which is a common problem in stock price research.

Current assets were chosen because they are an aggregate of cash and other easily liquidated assets. This is a good indicator of how well a company can handle unexpected financial hiccups. If they suddenly incur a huge expense they will need to have the capital on hand to deal with that. Total assets were chosen because as a company grows it will accumulate assets not covered by current assets such as land, new

buildings, or equipment. The more assets a company has, the better it is expected to do.

Current Liabilities measures the debt that the company has in the short-term (within one year). As this number rises the company gets into bigger trouble as it must worry about paying back its debtors very soon. Total Liabilities show how much the company owes. This can be to bondholders and other debtors alike. This is also closely tied to Stockholder's equity. A strong company would finance expansion through equity, not debt. Equity means that people want to invest in the company because they think it is very strong.

Earnings is another key variable. Expanding earnings leads to growth and intuitively, a higher stock price. Net Income is very important as that is the company's profit for the quarter. It should also be compared to earnings to see how much a company is actually getting in profit from each sale. It is more beneficial to have a high net margin because if costs of goods (materials, labor) rise or the price of their good falls (increased competition, lower demand) they have more of a buffer to stay profitable than a company who is barely making any profit off of each sale. The EPS ratio is one variable that will cause some auto-correlation but it is included because it gives a way to standardize earnings with respect to size of the company. Also the earnings variable consists of very large numbers and the EPS ratio is more manageable, and changes in it may be more significant.

Cash Flow and Dividends were found in the literature to be significant for stock prices as well (Ferson, 2008). Higher dividends will attract more risk-averse investors and cash flow will help a company deal with issues of illiquidity, attracting even more risk-averse investors. The past stock price is an independent variable as well. Simply because weak-form efficiency isn't 100% true is not sufficient reason to leave it out. It has been proven to show some benefits and it is a publicly available piece of information so it will be included.

The non-financial variables were chosen because investors may also take them into account. Recessions are shown to be highly correlated to the stock market. It was estimated that nearly $7 trillion dollars was lost in investments

Table 1: Empirical Model

	Variable	Description	Expected Sign
Dependent Variable:			
	Stock Price	Stock Trading Price	NA
	% Return	Current Trading Price – Past Trading Price / Past Trading Price	
Independent Variable			
Financial Variables			
	Stock Price (T-1)	Stock Price of Past Quarter	+
	Dividends	Amount Paid per Share	+
	Current Assets	Assets that are easily Liquidated	+
	Total Assets	Current Assets + Illiquid Assets	+
	Current Liabilities	Debt due within One Year	-
	Total Liabilities	Current Liabilities + Long-Term Debt	-
	Total Stockholder Equity	Capital Received from Sale of Stock + Donated Capital + Retained Earnings	+
	Earnings	Gross Earnings for the Quarter	+
	EPS	Earnings per share	-
	Net Income	Net Profit or Loss	+
	Cash Flow	Change in Cash during the Quarter	+
Non-Financial Variables			
	Volume	Current Number of Share being Traded	+/-
	Recession	Dummy variable for state of economy. 1=Recession 0=Expansion	-
	DJIA (T-1)	Value of the Dow Jones in the Previous Quarter	+
Recent News Variables	Acquisition Small	Dummy Variable for whether or not there was an Acquisition/Merger under $10 million, 1=Yes, 0=No	+
	Acquisition Med.	Dummy Variable for whether or not there was an Acquisition/Merger between $10 and $100 million, 1=Yes, 0=No	+
	Acquisition Large	Dummy Variable for whether or not there was an Acquisition/Merger over $100 million, 1=Yes, 0=No	+
	Divestitures	Dummy Variable for whether or not there was a Divestiture that quarter, 1=Yes, 0=No	-
	Mgmt Change	Dummy variable for whether they changed CEO's that quarter, 1=Yes, 0=No	-

during the last recession (World Federation of Exchanges, 2011). That is 50% of the value of the NYSE as a whole. The DJIA is another variable that will be an indicator of the business cycle. It represents the strength of the stock market as a whole and using real numbers may be more beneficial than using a dummy variable. I take past movement of this index in an effort to predict future movements of an individual company based on momentum.

Volume refers to the demand for a stock and how many shares are traded. This could be either buy or sell orders. This means that the coefficient could have either sign. This variable is more correlated with stock price volatility but it is still an important component found on nearly every stock analysis so it will be included in this regression as well.

The last five variables are dummy variables to judge the effect of acquisitions, divestitures and changes in CEO. These events are not numerical and are not reflected in the financials but could all have significant effects on a company. Acquisitions are divided into three categories: small (under $10 million), medium ($10-$100 million) and large (over $100 million). These should have a positive coefficient if significant because they would grow the company thus increasing future expected business and earnings. Divestitures should have a negative sign because the company is shrinking and may worry investors due to the fact that the company needs to sell off parts of their business for excess cash. On the other hand, some divestitures may help a company if they are selling off failing parts of their business. We assume the first effect will be stronger so the coefficient will still be negative.

Management Changes explain when a new CEO took over. This is expected to have a negative sign due to uncertainty of the effectiveness of the new CEO. This is another variable that could go either way if the new CEO turns out to be stronger than the old CEO. Depending on the sign, it will give interesting information as to what tends to happen when CEO's are replaced. These variables will also give insight into how long it takes for an event like this to have an effect. The dummy variables will be marked as 1 as soon as the event is announced under the assumption that investors and the companies are future-oriented.

IV. RESULTS

The results of this paper are divided into three sections: the regressions run attempting to predict future stock prices, the regressions run attempting to predict the returns, and a section looking at comparative results. We compare which method is more effective for an investor to use to find promising stocks to invest in. As expected the R-squared for the return regressions were much lower than for the price regressions.

Table2: Dependent Variable Stock Price

	Model A		Model B	
	Coefficient	t-statistic	Coefficient	t-statisitc
(Constant)	7.998	2.696	4.023	3.064
Price(t)	.971	26.218***	0.946	41.82***
Recession	-.953	-.942	-	-
Volume	.000	-1.353	-3.50E-08	-2.081**
Acq Small	-1.061	-1.319	-	-
Acq Med	1.047	.588	-	-
Acq Large	.764	.653	-	-
Divestitures	-.664	-.911	-	-
Management Changes	.978	.493	-	-
Dividends	5.060	1.881*	4.013	1.796*
CA	.000	1.717	-	-
CL	.000	-2.058**	0	-2.696***
SE	.000	-1.313	-	-
TL	.000	1.159	-	-
Revenues	.000	1.419	6.43E-05	2.626***
NI	.001	1.740*	-	-
EPS	-2.686	-1.561	-	-
Cash	.000	-1.621	-	-
%change over Q	2.731	.729	-	-
% change div	-1.439	-.669	-	-
% change CA	1.156	.367	-	-
% change TA	7.449	.792	-	-
% change CL	.799	.755	-	-
% change SE	-1.853	-.555	-	-
% change TL	-6.331	-1.560	-	-
%change rev	2.149	1.393	-	-
%change NI	.075	.044	-	-
%change Eps	-.729	-.438	-	-
%change cash	-1.285	-1.048	-	-
DJI	.000	-1.386	-	-
ChangeDJI	5.166	.885	9.585	2.258**
R-squared	.943		0.938	
Durbin Watson	2.008		1.863	

* means significance at the 0.1 level
** means significance at the 0.05 level
*** means significance at the 0.01 level

In Table 2, you can see the results of the regressions run with Current Market Price as the dependent variable.

Model A was the initial regression run using all independent variables and their relative changes over the past quarter. The R-squared was .943 which means 94.3% of the variation was explained. This at a first glance looks very promising however when we delve deeper into the numbers we run into some core problems. Model B is Model A after dropping one variable at a time until only significant variables remain. As you can see the R-squared only drops to .938 but eliminates the majority of the variables. This seems very good, however, if only the past price variable is used we were still able to get an R-squared of .933. We attribute this to the fact that this model is predicting prices, not movements. So if the stock price is $100 and the past price is $95 then it would be very close but it would not do anything to predict that $5 movement. This gives support to weak-form market efficiency that the past price would be the best predictor. The Model B semi-strong regression still does get a slightly higher R-squared value but finds some variables to be significant. Also in Model B, none of the percent change variables remain significant. This is counter-intuitive to the semi-strong theory that the new information would be the determinant of future movements. Also counter to this paper's hypothesis, none of the dummy variables for recent news were significant. This could mean they are either insignificant in predicting stock movements or just insignificant one quarter after the event happens. It may take a year or more for a new CEO or acquisition to have any effect on the company. It could take more time than a quarter for large changes to have an effect. Another theory is that they might have an effect on stock movement but not the stock price in levels.

Table 3:Dependent Variable: % Return

	Model C		Model D	
	Coefficient	t-statistic	Coefficient	t-statisitc
(Constant)	.201	3.510	0.156	3.038
Price(t)	-.001	-1.510	-	-
Recession	-.019	-.968	-0.036	-2.323**
Volume	.000	-1.715*	-	-
Acq Small	-.018	-1.152	-	-
Acq Med	.022	.639	-	-
Acq Large	.007	.312	-	-
Divestiitures	-.026	-1.875*	-0.023	-1.849*
CEO Changes	-.012	-.302	-	-
Dividends	.079	1.516	-	-
CA	.000	1.882*	-	-
CL	.000	-1.997*	-	-
SE	.000	-1.121	-	-
TL	.000	1.120	-	-
Revenues	.000	1.253	-	-
NI	.000	1.316	-	-
EPS	-.037	-1.108	-	-
Cash	.000	-1.517	-	-
%change over Q	.106	1.456	0.137	2.427**
% change div	-.016	-.382	-	-
% change CA	.030	.495	-	-
% change TA	.230	1.262	-	-
% change CL	.015	.720	-	-
% change SE	-.059	-.913	-	-
% change TL	-.186	-2.372**	-0.097	-2.727***
%change rev	.038	1.264	-	-
%change NI	-.005	-.140	-	-
%change Eps	-.011	-.355	-	-
%change cash	-.028	-1.163	-	-
DJI	.000	-1.681*	-1.03E-05	-2.269**
ChangeDJI	.067	.592	-	-
R-squared	.174		0.084	
Durbin Watson	2.158		2.123	

* means significance at the 0.1 level
** means significance at the 0.05 level
*** means significance at the 0.01 level

The significant variables are past price, volume, dividends, current liabilities, and revenues. Past price is by far the most significant, which can be expected as stocks don't tend to change drastically so this number is always very similar to the dependent variable of current stock prices. Volume was interesting in that it was significant with a negative sign. That means that as more shares are traded it actually leads to a lower share price. This could mean investors are pessimistic and tend to sell in mass rather than buy in mass. Revenues and dividends both agree with past studies in that they should be significant. Dividends however were only significant at the 10% level. When we look at the three variables used to most accurately rate the effect of a recession, only one is significant. It agrees with past literature and has the predicted sign. It seems though that at least when predicting prices the

past movement of the Dow is a more accurate measure than a dummy variable or the actual value of the Dow. Past literature has also found cash flows to be highly significant as well as ratios involving total assets. Our study was the only one that included past price which was so highly significant it could have hurt the significance of other variables. That could be why other studies found a number of other variables significant.

The results of the past section show that there is some merit in market efficiency as you can get close to estimating the price using publicly available information. However, it gives little to no help in determining what the future returns will be and what causes stock price changes. This is very limited in its use because one could simply look up the stock price, there is no reason to try and predict it. The next section runs regressions attempting to predict returns which should be more difficult but give much more applicable information. The regressions can be seen on the in Table 3.

By looking at the R-squared, it is very easy to see that predicting returns is a much more daunting task, however the results generate much more applicable information. Model C is a regression using all the variables. There were only a few significant variables including volume, divestitures, current assets, current liabilities, percent change over past quarter, percent change of Total liabilities and the DJIA. Only the percent change of total liabilities was significant past the 0.1 level. In Model D we dropped variables one by one until only significant variables remained. This time we were left with recession, percent change over the past quarter, percent change of total liabilities, divestitures and DJIA. This regression's R-squared was hurt a lot by taking out all the extra variables, however, because the variables were insignificant, it could have been that they were correlated with the error term and the R-squared was artificially high in the Model A. Having the change over the past quarter significant gives more proof that weak-form efficiency does have some merit. This is the only regression in which divestitures are significant, and it was only significant at the 0.1 level. It is interesting to note that this was the only recent news variable that was significant. One would think that the large acquisition would have more importance because it is typically larger in scale. However, this information points to the fact that an investor would prefer to invest in a company that doesn't have any divestitures than a company that has acquisitions. In this regression we find the change in total liabilities to be highly significant. That supports our findings in terms of divestitures that investors may tend to be slightly more pessimistic and would prefer to not see anything negative.

All of the variables had the expected sign except for DJIA. Its coefficient was negative but one would expect that an increase in the overall stock market would lead to an increase in a firm's stock price. This phenomenon could be due to simple math. If a company's stock price is $100 then a $5 dollar change would only be 5%, while if a $10 company had a change of $5 it would be 50%. When the DJIA is very high, the returns are diminished and stock prices are always highest before a recession. The same is true for when

Table 4: Comparison Table

	Model B		Model D	
	Coefficient	t-statistic	Coefficient	t-statisitc
Constant	4.023	3.064	0.156	3.038
Price(t-1)	0.946	41.82***	-	-
CL	0	-2.696***	-	-
Volume	-3.50E-08	-2.081**	-	-
Dividends	4.013	1.796*	-	-
Revenues	6.43E-05	2.626***	-	-
% ChangeDJI	9.585	2.258**	-	-
Divestitures	-	-	-0.023	-1.849*
% price change over Quarter	-	-	0.137	2.427**
% change TL	-	-	-0.097	-2.727***
Recession	-	-	-0.036	-2.323**
DJI	-	-	-1.03E-05	-2.269**
R-squared	0.938		0.084	
Durbin Watson	1.863		2.123	

* means significance at the 0.1 level
** means significance at the 0.05 level
*** means significance at the 0.01 level

stock prices are at their lowest. That is when they tend to increase and experience the highest returns because their values are deflated.

When comparing the two types of regressions to each other we can come up with some results regarding the overall effectiveness of each variable. Table 4 shows them side by side.

When looking at each regression side by side we can see how difficult it is to predict stock movements. The regressions shared none of the same significant variables. However there are some results to pull from the data. In the price regression (Model B), it found past price, current liabilities and percent change of DJIA all to be significant. In the return model (Model F), it found percent price change over the past quarter, percent change total liabilities and the recession dummy variable to be significant. It would seem that the past value, state of the economy and some measure of debt would be significant when looking at predicting stock movements. It would just differ depending on the dependent variable.

When comparing which model is more useful we would find that Model D and using returns as the dependent variable offer for important findings. This is because even though Model B had a higher R-squared, it has very limited application from its results. An investor would be interested in a stock's future movements, not its actual price. Model D did find significance in some variables, both in recent news variables and financial variables. Even if the results had small effects it still improved the regression over using just past price movements so semi-strong theory does have merit.

V. CONCLUSION

While the regression did not by any means prove conclusively that it could predict stock prices it did bring some interesting facts into view. It is in fact much easier to run a regression to estimate stock prices; however that does not necessarily mean that it can predict stock movements as shown in the return regressions. This study was able to shed some light on the effectiveness of market efficiency. The high R-squared in the price regression could mean that a stock price is a vector of all publicly available information; however it does not necessarily mean that changes in its fundamentals will dictate future movements of the price. Another implication one could take from this study is that strong efficiency is a much better predictor than semi-strong form. That would mean that insider trading and other variables that would not be accessible are really what determine stock price movements rather than their fundamentals or recent news. An interesting finding was that variables that tended to be related with negative events (divestitures, liabilities) were significant and their more positive counterparts (acquisitions, assets) were not. This means that investors tend to be cautious and pessimistic. An investor doesn't like a positive event as much as he or she likes to avoid a negative event.

There are a number of ways that this study could be improved upon. One issue with this study is that stock prices react to information on a quarter by quarter basis. That is a gross over-assumption. In future studies one could test the predictive power of returns for one week, one month, or one year. The longer horizon might be more able to capture long term trends and the shorter-horizon might better represent the investors that use high-frequency trading strategies. Another way to expound upon this study would be to add lags further back than one quarter. It could be markets are acting faster or slower than one quarter and if they are acting slower then more lags would better capture changes. This would also better capture momentum. As percent change over the past quarter was shown to be significant in predicting returns, these regressions would "forget" that past quarter as soon as the new quarter was introduced. If we added more lagged terms it could better show trends longer than one quarter. A third improvement on this study would be to either add in more companies or to increase how long each company was measured for. If more recessions were included then we could get a better idea of that effect. This effect could also help the CEO change variable become more accurate as no company had more than one CEO change in the recorded 7.5 years. A fourth and final improvement would be to find a better way to account for recent events than a dummy variable. We had attempted to differentiate acquisitions based on size however it was not effective enough. If there was any way to quantify any of this data beyond a 1 or 0 then it could lead to more accurate predictions.

Even though this study only got an R-squared of 8.4%, Soderlind only got an R-squared

of 10.4% and his estimates were able to beat analyst estimates (2010). A low R-squared is to be expected in studies such as this as any abnormal return would throw off the regressions by a large amount. It could predict the stock price going up but then be off entirely on the magnitude of the increase. it would be interesting in the future to run the regressions found and calculate what return this investment strategy would actually earn.

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